UNIVERSITY OF HOUSTON
DEPARTMENT OF BIOLOGY
CULLEN BOULEVARD
HOUSTON 4, TEXAS

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Dr. Joshua Lederberg
Department of Genetics
School of Medicine
Stanford University
Stanford, California

Dear Dr. Lederberg:

Please forgive me for my delay in answering your letter of April 10th. I have been away from the office on a business trip.

I have given considerable thought to your question pertaining to the decontamination of interplanetary missles and I shall try to discuss my thoughts on this problem.

Missles of this type contain machined metal parts. The parts are composed of brass, aluminum, and steel and small quantities of other metals. These parts should be contaminated with Pseudomonas species, Escherichia coli, Proteus species and paracolon bacteria. These organisms are capable of surviving on metal surfaces and should be on the parts. Sometimes machined metal parts are washed to remove oil and other material and in this case the flora should be markedly reduced. The parts may be handled enough in the process of assembly to contaminate them with bacteria found on the human skin. As a matter of fact I believe all of the parts of the "bird" should be contaminated with bacteria associated with man. When one considers the time and labor that is needed to construct some of the electronic components it would seem that considerable contamination should take place. In addition, I would suspect that there should be an influx of microorganisms that are associated with the deterioration of the materials in the missles. These rockets are sent up from humid subtropical and tropical or subtropical steppe areas (Florida and California) in this country. The missles are usually in storage in these regions for several weeks or months while final assembly and stationary ground tests are made. I suspect this is ample time for contamination of the parts to take place.

The glass in the electronic equipment should contain fungii in addition to bacteria. The wire insulation should contain Micrococcus species, Psuedomonas species, Flavobacterium species, Mycobacterium species and Corynebacterium species. These are the bacteria found on plastic coatings according to a confidential report that I have in my files.

The electronic systems contain some shellac. This material can support the growth of moulds and bacteria.

There are a lot of materials in the rocket that are new and have not been studied for their microbial load. For example, what types of bacteria are found on recording tape, and the new ceramic materials?

There is one factor in your favor in decontamination of these rockets. There must be a considerable reduction in microbial load due to irradiation at high altitudes. This should reduce the load considerably, however, I don't think anyone knows how much.

I believe a lot of tests will have to be made before you will have the answer to your problem. I believe the only thing one can do is get the parts and study their flora. This will be a big job.

I certainly hope this information is of value in your work.

We have talked about adding a new staff member in microbial genetics during the 1960-61 academic year. Do you have any graduate students that will complete their work at that time who might be interested in a position on our staff?

The state SAB chapter has a annual I. M. Lewis lecture in bacteriology. This lecture will be given in October or November of this year. I wonder if we could prevail on you to give this lecture. We shall be most happy to pay your travel expenses and there is an honorarium for the talk. The meeting will be here in Houston and we would undoubtedly have a large crowd for such a distinguished lecturer. I shall look forward to any remarks you may have pertaining to this question.

I shall consider it an honor to be able to help you in any way with your problem. Please do not hesitate to write if you feel I can be of value.

Kindest personal regards,

E. O. Bennett

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